

What is claimed is:

- 5 1. A four-port circulator comprising:
a polarization beam splitter;
a first reflector coupled with the polarization beam splitter;
a first non-reciprocal device coupled to the first reflector;
a second non-reciprocal device coupled to the polarization beam splitter; and
a second reflector coupled with the polarization beam splitter.
- 10 2. The four-port circulator of claim 1 further comprising an isolator coupled to the polarization beam splitter.
- 15 3. The four-port circulator of claim 1 further comprising a polarizer coupled to the first non-reciprocal device.
- 20 4. The four-port circulator of claim 1 further comprising a polarizer coupled to the second non-reciprocal device.
- 25 5. The four-port circulator of claim 1 further comprising an isolator coupled to the first reflector.
6. The four-port circulator of claim 1 wherein the first non-reciprocal device includes a half wave plate and a Faraday rotator.
7. The four-port circulator of claim 1 wherein the second non-reciprocal device includes a half wave plate and a Faraday rotator.

Sub
AS 5
8. A method for transmitting light among a first port, a second port, a third port, and a fourth port, the light having either a first polarization or a second polarization, the method comprising:

forwarding a first light signal received from the first port with the first polarization to a polarization beam splitter;
directing the first light signal to a first reflector;
reflecting the first light signal to a first non-reciprocal device;
changing the polarization of the first light signal from the first polarization to a second polarization; and
10 directing the first light signal into the second port.

15 9. A method of claim 8, further comprising
forwarding a second light signal received from the first port and having the second polarization to a polarization beam splitter;
directing the second light signal to a second non-reciprocal device;
keeping the polarization of the second light signal; and
directing the second light signal into the third port.

20 10. A method of claim 9, further comprising
sending a third light signal from the second port with the second polarization to the first non-reciprocal device;
keeping the polarization of the third light signal;
reflecting the third light signal to the polarization beam splitter;
directing the third light signal to the second reflector; and
25 reflecting the third light signal into the fourth port with the second polarization.

11. A method of claim 10, further comprising
sending a fourth light signal from the third port with the second polarization to the second
non-reciprocal device;
changing the polarization of the fourth light signal from the second polarization to the
first polarization;
5 directing the fourth light signal to the polarization beam splitter;
directing the fourth light signal to the second reflector; and
reflecting fourth light signal into the fourth port with the first polarization.

10 12. The method of claim 8 wherein the step of directing the first light signal into the
second port includes directing the first light signal into the second port through a polarizer.

15 13. The method of claim 9 wherein the step of directing the second light signal into
the third port includes directing the second light signal into the third port through a polarizer.

14. The method of claim 8 wherein the step of sending the light signal with the first
polarization to a polarization beam splitter includes sending the first light signal with the first
polarization to a polarization beam splitter through an isolator.

20 15. The method of claim 9 wherein the step of sending a second light signal with the
second polarization to a polarization beam splitter includes sending the second light signal with
the second polarization to a polarization beam splitter through an isolator.

25 16. The method of claim 10 wherein the step of reflecting the third light signal with
the second polarization into the fourth port includes reflecting the third light signal into the fourth
port with the second polarization through an isolator.

30 17. The method of claim 11 wherein the step of reflecting the fourth light signal with
the first polarization into the fourth port includes reflecting the fourth light signal with the first
polarization into the fourth port through an isolator.

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